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Science News-Letter
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The Weekly Summary of Current Science
A Science Service Publication

Edited by Watson Davis
Vol. XII No. 343

10¢ a copy $5 a year
November 5, 1927
PHYSICS

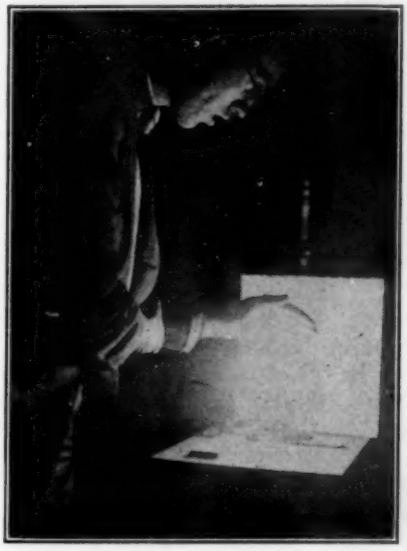
Wire Explosions Give Light Brighter Than Sunlight

By James Stokley

The hottest place in the world, where a scientist has created a temperature of 45,000 degrees Fahrenheit, far higher than the hottest oven, electric furnace or arc light, and a light more brilliant than the sun—such is the distinction of a medium-sized white building in the pleasant California city of Pasadena. This is the physical laboratory of the Mt. Wilson Observatory, of the Carnegie Institution of Washington, where Dr. John A. Anderson has been literally blowing apart iron wires by passing extremely powerful electric currents through them. With the attainment of such a temperature, the experimenter is able to imitate conditions on the stars themselves, and in fact, this is attested by the spectrum photographs which he has made. The spectrum of the exploded wires consists of a continuous spectrum crossed by numerous dark lines, similar to the spectrum of the sun itself.

Dr. Anderson thought of this experiment from a consideration of one theory of the source of the sun's heat. According to this theory, the fuel which keeps the sun going is supplied by meteorites or "shooting stars" from outer space, which are constantly falling into it, and according to his calculations an inconceivably great amount of energy can be supplied. The attraction of gravitation at the sun is such that a meteor falling into it from outer space will land with a speed of 3700 miles per second, or about 5000 times as fast as a rifle bullet, and its energy will be so great that, if it were all converted into heat, a meteor weighing only one ounce would be able to melt seventy tons of ice to water and raise it to the boiling point!

When such a meteor is brought to a quick stop, as it would be when it hits the sun, this vast store of energy, or at least a large part of it, would be liberated, and to find out what would happen Dr. Anderson set about to duplicate the effect experimentally. To do this, he says, it was necessary to "throw a large amount of energy into a small amount of matter in as short a time as possible," and though it seems impossible to do it by mechanical means, as by the actual stopping of a rapidly moving mass, it seemed worth trying by electrical means.



Despite the high temperature of the explosion, it is so short that it does not have time to heat nearby objects, and it is safe to hold one's hand within a few inches of the flash. This picture was made entirely by the light of the explosion.

It was evident that a very heavy electric charge would have to be piled up, and then released in an instant of time. So he constructed a large condenser, similar to those used in radio work, but much bigger. It consisted of a series of 98 glass plates, each 16 by 20 inches, covered with tin foil, and could be charged to 25,000 volts. An improvement was obtained in a second condenser he constructed, in which sheets of wired glass, the kind that is frequently used in office buildings, was used instead of the foil covered plates. This one can be charged to 50,000 volts. In use, the wire is connected to the condenser, the generator is started and the current begins to flow into the condenser. As the condenser becomes charged, it finally holds enough electricity to make a spark jump across a gap. The current then flows into the iron wire, exploding it with a sharp report and a brilliant flash.

When the experimenter is standing near the exploding wire, he first sees the flash—is nearly blinded by it, in fact—then he feels a puff of air on his face and hands. This is the sound wave, carrying the noise of the explosion.

With such a brilliant light, the explosion may easily be photographed by merely pointing a camera at the wire. If the room is darkened, and the camera shutter opened, the explosion's own light records itself on the plate. These photographs have been used by Dr. Anderson to measure the intensity of the flash, for the photographic negative may be compared with a similar negative of the sun, and by comparing the amounts of light that can go through each, the brightness of the explosion as compared with the sun can be found. In this way, Dr. Anderson has found that the brightness of the explosion is at least 100 times as bright as an equal area of the sun's surface, so that he has produced the most brilliant source of illumination in the world, or indeed, so far as we are aware, in the entire solar system!

But Dr. Anderson was interested not only in the brightness of the explosion, but also in the way in which it developed, and he set out to take what is practically a moving picture of the explosion from the start. By means of a revolving mirror, the pic-

(*Just turn the page*)

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Wire Explosions

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ture of the explosion is spread out into a long, comet-like trail, increasing in width as the mass of expanding gases become larger. The speed of the turning mirror is known, and so the speed of the expanding gases has been determined, and they are found to move as fast as a mile a second.

Despite the energy of the explosion, and the high temperature, it is not dangerous to persons nearby, and one's hand may be safely held within a few inches of the wire when it goes off. The air wave is felt on the palm, but it is not unpleasant. The sharp report, however, is hard on the ear drums, and, like gunners who operate large guns, it is necessary to keep the mouth open during the explosion in order that the pressure on the ear drum may be equalized.

Though the temperature is so high, the explosion is so short that it does not have time to heat up nearby objects, and if a piece of tissue paper is placed over the wire, it is torn by the force, but not even slightly charred. However, no attempt has been made to hold the wire as it explodes, for the result would probably be disastrous.

The chief value of these experiments, thinks Dr. Anderson, is in the fact that here we have an imitation, inadequate though it may be, of what occurs in the sun, or any star, in fact, when a meteor falls into it. For the first time in the history of science we are able to study in the laboratory what occurs at a temperature approaching that of some of the stars.

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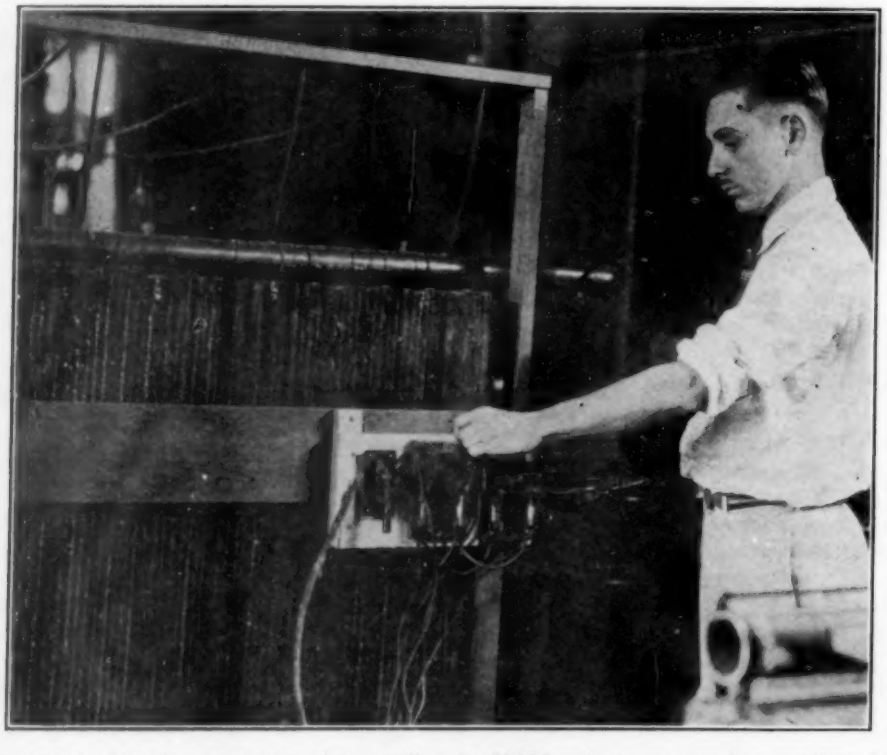

Part of the big glass condenser that supplies the 50,000 volt current used to explode the wires. Mr. Pompio is shown turning on the current to make an explosion.

SCIENCE NEWS-LETTER, The Weekly Summary of Current Science. Published by Science Service, Inc., the Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Publication Office, 1918 Harford Ave., Baltimore, Md. Editorial and Executive Office, 21st and B Sts., N. W., Washington, D. C. Address all communications to Washington, D. C.

Entered as second class matter October 1, 1926, at the postoffice at Baltimore, Md., under the act of March 3, 1879. Established in mimeograph form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

Subscription rate—$5.00 a year postpaid. 10 cents a copy. Ten or more copies to same address, 5 cents a copy. Special reduced subscription rates are available to members of the American Association for the Advancement of Science.

Advertising rates furnished on application.

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ASTRONOMY

Comet Had Small Nucleus

The Pons-Winnecke comet, which occasioned much excitement last summer when it came within 4,000,000 miles of the earth, had the distinction of possessing the smallest nucleus that has ever been observed in such a body. Probably it was not more than two or three miles in diameter. This is announced by Dr. V. M. Slipher, director of the Lowell Observatory at Flagstaff, Arizona.

Dr. Slipher tood advantage of the close visit of Pons-Winnecke to watch it carefully with the observatory's big refracting telescope, which has a lens two feet in diameter. He had, he says, the best opportunity in years to make a measurement of the size of a comet's nucleus, the center which is supposed to supply the rest of its material. On most occasions, he says, "the nucleus of the comet was found to be perfectly stellar, i. e., very small and sharp." At such times "it was possible to distinguish the nucleus from stars only by its motion."

Even through the highest power telescope a star appears as a point of light. First Dr. Slipher compared the cometary nucleus with nearby stars. Then he took stars of similar brightness in another part of the heavens, near the planet Jupiter, and compared them with the large moons of that planet. As the size, and distance, of the Jovian moons are known, it was thus possible to estimate the size of the nucleus. Its distance from the earth was also known, and thus it was possible to get a rough approximation of its diameter.

(*Just turn the page*)

SOCIOLOGY

Red Cross Roll Call

Relief in seventy-seven disasters at home and twenty in foreign lands; assistance to an average of 62,000 disabled ex-service men and their dependents each month; welfare work in many fields; training of thousands of life savers and first aid experts; all these and many others are among the services rendered the past year.

Because of the constantly increasing demands on its many services, at the time of its eleventh annual membership roll call from Armistice Day through Thanksgiving — November 11-24—The American National Red Cross will seek an enrolment of 5,000,000 adult members for the coming year.

PHYSICS

JOHN AUGUST ANDERSON

A Modern Jove

Jove, so the old mythologies tell us, used to entertain himself by hurling thunderbolts down at the earth. The only difference between this performance and that accomplished by Dr. Anderson (described in our leading article of this issue) is that he hurls his thunderbolts into fine iron wires. And surely the results entitle them to be called thunderbolts.

Exploding wires is not his only claim to fame, however. Out in California plans are rapidly coming to fruition by means of which a chain of seismograph stations will keep earthquake experts informed of the state of the earth's crust under them, much as the barometer enables the weather man to keep tabs on the air above him. Perhaps eventually earthquakes may actually be predicted. What concerns us now, however, is that the seismographs are of a type known as the "Wood-Anderson," after Dr. Anderson and his colleague, Dr. Harry O. Wood, who jointly developed them. This instrument has filled the need for a small, inexpensive and reliable seismograph.

It is as an astronomer, rather than a physicist, that Dr. Anderson classifies himself in "Who's Who." It was as such that he traveled to Sumatra with the party from the U. S. Naval Observatory in January, 1926, to photograph the flash spectrum of the eclipse at that time. In 1905 he traveled to Spain with astronomers from the same institution for the same purpose.

(*Just turn the page*)

CHEMISTRY

Nordic Power is Chemical

By Edwin E. Slosson

The most momentous movement in modern history is the spread of the power of the northern European branch of the white race over the entire world within the last 150 years. These people are now preeminent in the political, military, industrial, commercial, scientific and literary sense. Practically, there are only four countries that are not under their control: China, which is too numerous, Japan and Turkey which are too war-like, and Abyssinia which subsists by sufferance. This unparalleled expansion of imperialism is due to two factors; one, internal and the other external. The first is the native ability of the white race, and the other is their application in commerce and industry of the laws of gases and particularly Gay-Lussac's law that the pressure of a gas varies with the absolute temperature.

Modern civilization is based upon molecular anarchy. By releasing the atoms from their confinement in liquids and solids, they attain in the form of a gas absolute independence and democratic equality. That is to say, the development of modern civilization and the expansion of Nordic stock throughout the world is essentially a chemical reaction. It is the expansive force of gases released at high temperature from gunpowder and nitrocellulose that has enabled these peoples to become irresistible in warfare. It is the expansive power of steam that has given us the stationary steam engine, the locomotive and the steamship. It is the expansive power of water and carbon dioxide that has given us the internal ignition engine, the automobile and the aeroplane. The expansion of gases is, therefore, the principal physical factor in the world-wide expansion of north European races. These expansive gases have been produced from fossil fuel, coal and oil, which are limited in amount and capricious in distribution.

Suppose then our race should be deprived of this physical and external source of its power. Would then the internal and psychical factor suffice to maintain our present supremacy? For some twenty-five hundred years the question has been in dispute whether the rise of a nation is due to its natural resources or to its native ability, to the physical or psychical factor. Obviously

(*Just turn the page*)

Nordic Power

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both are essential. Their relative value has been hotly argued and is still unsettled. From the point of view of a scientist, such arguments are futile. A disputed question by crucial experiment we should have to deprive the dominant race of its external advantage, the possession of the sources of inanimate energy.

Such an experiment is going to be tried on a world-wide scale. We can almost date the time, when the vexed question will be put to proof.

The supply of petroleum will largely disappear within a period so short that most of us may expect to live to see that day. The supply of coal is also limited and the date of its exhaustion in Europe is only a few hundred years.

What will be the sources of energy which will support the civilization of the future? We cannot tell but it is quite likely that it will involve a transfer of the sources of power to other lands and alien races. For instance, if we should have to rely upon water power, the richest continents would be Asia, Africa, and South America. If we should devise a means of utilizing solar energy where it is least impeded by clouds and rain in its passage from the central power-house of the solar system to the ground, the sources of wealth will be the great Desert of Africa, Asia, South America and Central Australia. That is to say, so far as we could foresee the future, the possession of power will gradually pass from the white to the black and yellow races. What difference this will make to the world is something that I will not venture to guess.

Of course there is also the possibility which is indeed, in the light of history, a probability, that the internal and psychical factor, that is, hereditary genius and native ability, may be lost to the dominant races and be developed by some small group of people in any part of the world. This also is a chemical change but of so delicate a character as not yet to be under the control of the experimental chemist.

Science News-Letter, November 5, 1927

The trade rat, common in the southwest, is so called because when it takes an article away it leaves something else in its place.

A magnet that can lift 75 tons is used in a German steel plant.

A Modern Jove

(*Continued from page 291*)

Born in Rollag, Minnesota, on August 7, 1876, Dr. Anderson studied at Concordia College and one of the normal schools of his native state, later going to Valparaiso College, in Indiana, where he received his B. S. in 1900. His Ph. D. came from Johns Hopkins in 1907, where he remained until 1916. Since then he has served as a physicist on the staff of the Mt. Wilson Observatory in Pasadena, California.

Science News-Letter, November 5, 1927

News-Letter Features

Born over five years ago of the demand and interest of those individuals who had caught a glimpse of *Science Service's* news reports to newspapers, the SCIENCE NEWS-LETTER has since proved interesting to laymen, scientists, students, teachers and children.

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Pons-Winnecke Comet

(*Continued from page 291*)

This, he found, was not more than two or three miles.

Other studies of the comet were made by Dr. Slipher with the aid of a spectroscope attached to the big telescope. In this way, by analyzing its light, he found several very peculiar features. It has been supposed that comets are excited to great activity as they get near the sun, but the studies of Dr. Slipher of Pons-Winnecke as well as other comets, seems to contradict these views.

The spectrum showed very strongly the same dark bands that are revealed in the spectrum of the sun. This shows that the comet's light consisted largely of reflected sunlight. Also, in the band of spectrum there appeared rather weakly the bands that are associated with cometary light. A spray projecting from the nucleus towards the sun gave off more light of its own than any other part of the comet.

Besides having its activity reduced by approach to the sun, Dr. Slipher believed that its close approach to the earth may have also reduced the comet's light. In 1910, he said, it was found that the light emissions from Halley's comet were reduced as it approached the earth, and then became more intense as it drew away. Previously, it has been supposed that the earth has little influence on the activity of comets coming near it. If this is the case, it would account for the fact that Pons-Winnecke, despite its close approach to the earth, was much fainter than some astronomers had anticipated.

Science News-Letter, November 5, 1927

It has been found that the rubber tree has tubes containing the rubber juice close to the bark surface as well as deep in the center.

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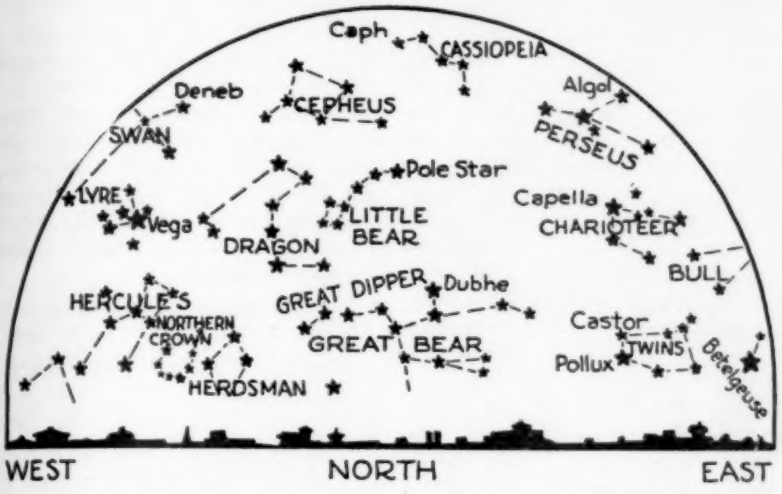
Mercury Crosses Sun and Meteors Visit Earth



By James Stokley

November, this year, brings with it two things of interest to the astronomer, but unfortunately one of them will not be visible to the United States. This is a transit of the planet Mercury, which occurs on November 8. Mercury is the nearest of all the planets to the sun—only thirty-six million miles away. The earth is 93 million miles from the sun. Like the earth, however, Mercury revolves around the parent of the solar system, but instead of taking 365¼ days to make its journey it does it in 88 days.

During October, Mercury as seen from the earth was at its greatest distance east of the sun. Then it was visible with difficulty in the evening twilight. Since then it has continued in its orbit, until on the 8th of the month it will be directly between the sun and the earth. This is called a transit of Mercury, and is a rather rare occurrence. Such transits always occur either in May or November. Though at times they may happen only seven years apart, they are usually at thirteen-year intervals.

However, for any one place on the surface of the earth, a transit is not so common. In the case of the one this month, the planet will have crossed the disc of the sun before sunrise in the United States. In Asia it will be seen to enter the sun's disc and to emerge from it; in Europe only the emergence will be seen. The last transit of Mercury with which the United States was favored occurred on May 7, 1924. The next will not come until November 14, 1953. While a transit is not so important as an eclipse and no expeditions will be sent from other countries to Asia to observe it. There are a number of observatories within the region in which it will be visible. They will observe it and from the data they obtain more accurate figures on the motion of Mercury can be secured.

Two Meteor Showers Coming

The second interesting event that November brings us is a pair of meteor showers. On practically any clear night throughout the year a person who watches the sky carefully for an hour or so will be rewarded by the sight of one or more "shooting stars." But some months of the year are especially favored. Meteors, for that is what astronomers call shooting stars, frequently occur in swarms or showers. One well known shower occurred in April and another in August, but two happen in November. The November showers are known as the Leonid and the Andromedids. On the night of November 14, and the later that night the better, watch the eastern sky. After a few minutes watching you will doubtless be rewarded by seeing some swift streaks of light which seem to come from a point below the horizon. If you wait until the early morning hours, the familiar sickle of stars in Leo will rise in the east. This well-known group has the shape of a question mark. Then you may see meteors going in all directions, seeming to radiate from a point in the sickle. If it were not for the light of the moon they would be even more numerous.

A week later, on the nights of November 20 to 23, the second of the November showers appears. This one will be more easily observed. These meteors will seem to radiate from a point in the constellation of Andromeda. It is from this constellation that they get their name. The Andromeda meteors are of a different character from that of the Leonids. The former seem to move more slowly and their paths are shorter. Also at this time the moon will arise so late that the entire night will be dark and the meteors will shine against a jet-black background.

Meteor Paths Parallel

In the case of both of these showers the shooting stars seem to emerge from one definite point in the sky. This is only an optical illusion. In reality these meteors are moving in parallel paths. Imagine a railroad where there are several rows of tracks together. Imagine also that you are on the signal bridge above

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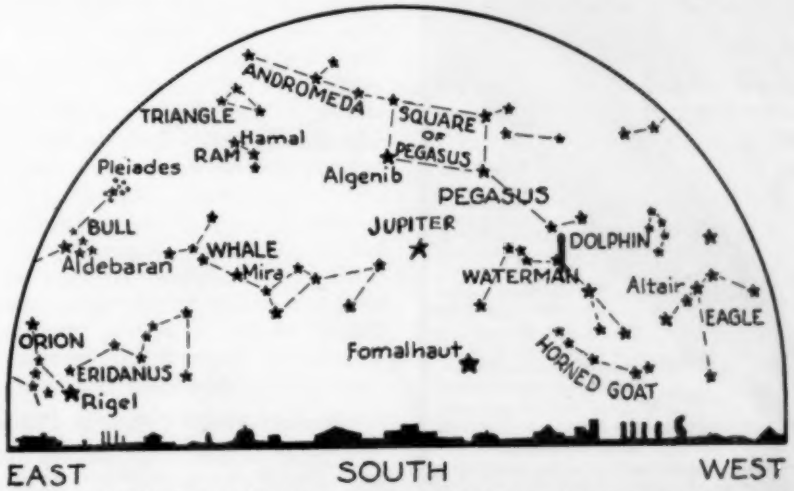

HOLD THESE MAPS IN FRONT OF YOU and face north or south. They will thus show the stars as they appear to you in the sky

November Skies

(*Continued from page 293*)

the tracks. As you look into the distance the rails seem to come together at a point miles away. Now imagine several trains coming toward you on adjoining tracks. Far in the distance, they will appear as a single spot and then as they come closer they appear to get bigger. The individual trains can be distinguished and they too will seem to radiate from a point in the distance.

The case of the meteors is very similar to this. The earth is the signal bridge from which we observe their approach. Like the trains they are moving along together. As they move through outside space they are invisible because they shine with no light of their own. But when they get to the gaseous layer or atmosphere which surrounds the earth, friction generates a tremendous amount of heat and they glow brilliantly. As they hit the outer layer of the atmosphere they correspond to the train in the far distance. They come closer to us and so seem to spread out. But like the trains they are moving in parallel routes. If we were high over the railroad track in an aeroplane, we would see that they were not radiating from a point at all. Likewise if we could get high enough above the earth and see the meteors approaching we would see that they too are parallel.

These meteors are, like the planets, members of the solar system. Myriads of them hover around the sun together. Their paths and the path of the earth cross at one point. This happens to be the part of the earth's orbit that it occupies in November, and so as we go through them in that month they become evident, although they were really there all the time. In some amusement parks there are places where a constant gush of air is blown out at such a height as to move the hat of the unwary passerby. Like the meteors, the air is moving across the path of the victim before he gets there, but without his knowledge. When he gets to the part of his orbit that happens to cross that of the air blast he feels the effect. Occasionally the meteors are much more numerous than at other times. In 1901, for example, as many as 800 were seen in a single hour by an experienced observer. But it was in the years 1833 and 1866 that the most remarkable display occurred. In the latter year they were so numerous that the effect was described as that of a huge celestial umbrella with luminous ribs; millions of them must have been visible to a single observer within a few hours.

As these great exhibitions were thirty-three years apart, it was supposed that in 1899 another great shower would be seen.

However, November 14, 1899, came and went with scarcely a meteor being seen. The next two years did see an unusually large number of them, but nothing to compare with the displays of 1833 and 1866. Apparently at some part of the meteor swarm they are gathered together into huge clumps. In 1833 and 1866 one of the densest of these happened to cross the orbit of the earth. In 1899, however, the clump probably missed us, much to the disappointment of thousands of people who had been led to expect some celestial fireworks.

Perhaps Pieces of Comets

The Andromeda meteors are also especially numerous during some years. It was 1852, 1885, and 1898 that they were especially well seen. The Andromedids, however, are of particular interest because their path seems to be the same as that of Biela's Comet. This comet reappeared several times and then completely vanished. But after it had ceased to appear as a comet, the meteor displays began. As their orbit was so close to that of the comet, it is pretty strong circumstantial evidence that in the meteor swarm we have the remnants of a comet which has gone to pieces.

Jupiter Only Evening Planet

Jupiter is the only planet that is left in the evening sky. Its position is indicated on the map. Venus, however, shines brilliantly in the east before sunrise. At the end of the month it will be joined there by Mercury. The stars are now assuming their winter aspect. Taurus, the Bull, is in the eastern sky, red Aldebaran, the bull's eye, serves as a good means of identifying it. To the northeast is the pair of heavenly twins, Castor and Pollux. Above them is Auriga, the Charioteer, with the brilliant Capella. To the southwest we have the great square of Pegasus. All these and others are shown on the map.

Science News-Letter, November 5, 1927

The best time to seed a lawn is in late summer.

The cloudiness and mists of the British climate are a handicap in the motion-picture industry there.

During the past 25 years, only 37 countries have taken an agricultural census. This represents only about 30 per cent. of the world's population.

Arctic explorers from the Field Museum have found the ruins of a house and the mining pits where sir Martin Frobisher dug for gold in Labrador in the sixteenth century.

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PHYSIOLOGY

Raises Drunken Rats

Science is doing its level best to ascertain the effects of alcohol on the living system.

Dr. Frank Blair Hanson assisted by Miss Florence Heys of Washington University, has been conducting an alcoholic experiment with ten generations of white rats that if translated into human years and generations would have covered a period of approximately 500 years.

The rats, all descendants of a single pair of identical ancestry, were divided into two groups. One set was kept under normal laboratory conditions while the others beginning at 20 days of age were put into an air tight fume tank over evaporating alcohol. They were left in this alcohol saturated atmosphere until they were all completely "drunk."

"The first effect of the alcohol," says Dr. Hanson in a report of the experiment that will appear in a forthcoming issue of the *Journal of Heredity*, "was to stimulate the rats to great activity. This exhilaration soon passed, however, and was followed by a period of sullenness and quarrelsomeness. The last period of the treatment was characterized by increasing drowsiness ending in unconsciousness. At this point the rats were removed from the tanks. It often took several hours for the animals to sleep off the effects of the intoxication.

"The direct effects of the alcohol upon the tests was disastrous in the extreme. The rate of growth was considerably slower in the alcoholic rats than in their untreated brothers and sisters. There were cases of paralysis and gross tremors. The

(*Just turn the page*)

SOCIOLOGY

British Birth Rate Falls

England is still suffering from a dearth of babies.

The actual number of births in England and Wales last year was as small as in the year 1860 when the population was only half its present magnitude, according to statistics just issued by the Registrar-General for the year 1926. The rate of 17.8 births per thousand is the lowest reached so far except during the years of the war.

This reduction in births is compensated only to a small extent by the low general death rate of 11.7 per thousand and the low infant mortality rate of 70 per thousand.

Science News-Letter, November 5, 1927

PSYCHOLOGY

Child's Confidence Needed

A mother and father can live in the same house with a child for years and still never know that child, because they have never won its confidence. This is the observation of Goldie Basch, of the Philadelphia Child Guidance Demonstration Clinic. Meanwhile, the neighbor or schoolmate in whom the child does confide is the person who is really influencing him and shaping his character.

Because so many parents ask how they can go about winning the confidence of a child, Miss Basch has listed the following suggestions:

"Begin early—as soon as the child can talk. With an older child begin today.

"Take time for a talk every day—it is the most important and interesting thing you have to do. Bedtime is a good time. Show an eager interest in whatever the child wishes to talk about, but never pry, and ask as few questions as possible. Don't give advice, unless asked for. Then be wholly frank and honest. Put yourself in your child's place; try to see things through his eyes. Never criticise him or his friends at such times. Don't even allow yourself to feel critical. Respect his opinions; convince yourself, for the time being, that he is an adult, and treat him accordingly."

Criticism and preaching will stop confidences from the child, Miss Basch warns.

"If you show yourself to be thoughtful and sympathetic when talking to him, he is much more apt to become so himself," she states. "Your child will be guided by what you are rather than by what you tell him to do."

Science News-Letter, November 5, 1927

BIOLOGY

The Wisdom of Worms

Philosopher and specialist,
To take the sum of things, a worm
Wriggled with scientific twist
And wholly efficacious squirm
Up to its door, and peering through
Saw faintly shining overhead
A lovely speck of distant blue,
Which having seen, it sagely said,
"Since that is all, then let me turn
Back to my work beneath the ground;
I know a thing for which I yearn
Full six feet deep—*there* truth is found."

—*William Adams Slade.*

Science News-Letter, November 5, 1927

MEDICINE

New Drug For Epilepsy

Epilepsy, the mysterious, incurable "falling sickness" that has afflicted mankind since the beginning of history, is now under medical attack from three separate angles.

Several years ago it was established that starvation brought about certain changes for the better in epileptics so long as they could endure the drastic treatment. Recently a diet that approximates some of the conditions of starvation has been found to give very successful results with epileptic children. Confined to the prescribed diet which calls for much fat but little sugar, afflicted children have shown marked improvement lasting over a period of years.

In addition, careful and understanding psychological handling has proved to be of great value in avoiding much of the mental and emotional strain that leads up to epileptic seizures.

Now a new weapon in the shape of the drug luminol-sodium is announced by Dr. J. Tyler Fox in a report to the medical journal Lancet.

Dr. Fox has tried out the drug in carefully regulated doses on members of the epileptic colony in Surrey, England, of which he is superintendent. Of 167 cases 50, or around 30 per cent, showed benefit that is likely to be permanent. Fifty-one cases after registering improvement for a period of three months apparently became tolerant to the drug. The remainder either showed only temporary gains or remained unaltered by the treatment. A very few became worse.

The best results are to be expected from young patients, Dr. Fox pointed out. Some patients have continued to receive the treatment for periods as long as four years, he declared. The drug should be administered with great caution because in some cases the number of fits have increased after the luminol was stopped. In a few cases where the number of fits decreased the behavior of the patients became violent and uncontrolled. The treatment appears to be of benefit in certain types of cases but should not be undertaken where careful supervision and accurate records of each seizure cannot be maintained for each patient.

Science News-Letter, November 5, 1927

Mount Rainier at one time was a seething volcano.

BIOLOGY

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Drunken Rats

(*Continued from page* 295)

normally white, well-groomed coats of the animals became discolored and unkempt. In appearance they were thoroughly degenerate.

"The eyes of the treated animals exhibited the most striking abnormalities. After only a few treatments many of them became totally blind. By the time the alcoholic rats were mature and mated nearly all were blind."

But of the 1,688 young born to the alcoholic parents throughout the ten generations only one was born with defective eyes, while among the control animals two defective eyed animals appeared. Descendants of the blind rat of alcoholic ancestry had normal eyes indicating that alcohol is powerless to induce hereditary eye defects in the white rat, at least. A small proportion of the descendants of the blind rats of control group had defective eyes.

"It seems," said Dr. Hanson, "that in almost any species a certain small percentage of defective individuals will be produced. In order to demonstrate the inheritance of induced eye defects or other abnormalities it will be necessary first to know the normal rate of production of spontaneous defects in the stock employed and then significantly modify that rate by alcohol or other deleterious agent."

Science News-Letter, November 5, 1927

Thousands of African natives have organized to fight the tsetse fly which carries African sleeping sickness.

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MEDICINE

Seek African Yellow Fever

Dr. Hideyo Noguchi, the well-known bacteriologist of the Rockefeller Institute for Medical Research, is en route for Lagos, Nigeria, to investigate the yellow fever that has been prevalent on the west coast of Africa for several months.

Dr. Noguchi will work in collaboration with the staff of the International Health Division of the Rockefeller Foundation at Lagos which has been working on the African yellow fever problem for some time. It is due to the efforts of the International Health Board that this once widely distributed disease has been almost entirely eliminated in the western hemisphere except for isolated cases in the interior of Brazil and other countries of South America. Every effort is being made to stamp out the fatal insect-borne malady before it gains a wider foothold in Africa or can spread to the Orient.

Dr. Noguchi already has to his credit a preventive vaccine and a curative serum for yellow fever developed in the laboratories of the Rockefeller Institute several years

(*Just turn the page*)

PSYCHOLOGY

Psychology Booming

"In the past 35 years, the number of American workers in psychology has increased to an extent perhaps without parallel in any other science or in any other country," declared Dr. J. McKeen Cattell, psychologist and editor of *Science*, in an address before the distinguished group of psychologists present at the inauguration of a psychological laboratory at Wittenberg College.

Chemistry is the earliest and psychology is the latest of the laboratory sciences, Dr. Cattell said. The very first laboratory for research and teaching of science was a chemistry laboratory opened by Justus von Liebig, at Geissen, Germany, in 1824. The first psychology laboratory was established by the German psychologist Wilhelm Wundt about 1879.

Dr. Cattell described his experiences as a student at Leipzig under the famous Wundt. In his reminiscences Wundt wrote that the young American student Cattell approached him and declared: "Herr Professor, you need an assistant, and I shall be your assistant."

Prof. Wundt's books on psychol-

(*Just turn the page*)

MEDICINE

Soda As Cold Preventive

That old familiar remedy, baking soda, has found a new use as a preventive for the common cold. Dr. Volney S. Cheney, medical director in one of the large packing firms of Chicago, has reported to the American Public Health Association.

Eleven years spent in an exhaustive study of colds have convinced Dr. Cheney that this too common malady is not infectious, as is commonly believed. The organisms usually regarded as the causative factor in colds are only secondary invaders in the later stages, he declared.

The primary cause he ascribed to be a condition of mild acidosis that is brought about by too much protein in the diet, lack of exercise and infections already present anywhere in the body. Dr. Cheney maintained that colds can be prevented and even cured by keeping an alkaline balance in the body through proper diet and carefully regulated doses of sodium bicarbonate or alkaline waters along with small quantites of calcium and iodin.

"My experience of many years," said Dr. Cheney, "among the aborigines of the southwest convinces me that colds, as we know them, are a product of civilization.

"The infectious origin of a cold is only an unproven theory, and a theory based upon a false premise because in the early stages of a cold the secretions, from the nose particularly, are frequently sterile and the organisms usually regarded as being the causative factor are only secondary invaders of the latter stages.

"Climatic variations are a contributing factor only so far as they inhibit our normal activities and decrease our utilization of protein foods which are always in excess of what we normally require. We eat too much and exercise too little in cold weather. Colds are less frequent in warm weather because we eat less of high protein foods and exercise more.

"The time of greatest incidence of colds in our industry is on a Monday and days following holidays, and also days following banquets or parties where there is an abundance of good things to eat. I have also observed that colds are very prevalent in our traveling salesmen, or men who are on the road a great deal. After these trips, upon inquiry, I have ascertained that always while traveling there has been a decided change in the daily routine compared to the one they maintain while at home; a proneness to over-eating of high protein foods and sometimes over-drinking of alcoholic stimulants; increased mental strain; lack of proper exercise and loss of sleep."

Statistics show that about 45 per cent. of absenteeism in most of our large industries is caused by colds or their after effects, Dr. Cheney added.

Science News-Letter, November 5, 1927

SOCIOLOGY

Mexican Exodus

The wholesale immigration wave from the Rio Grande north is perplexing Mexico as well as the United States, for if the exodus continues to increase as it has in the last 20 years, the whole population of Mexico will have moved out in fifty years, unless figures lie.

Dr. Manuel Gamio, who has just returned to Mexico City from the United States, says the possible consequences are enormous for both countries. Certain industries in the United States depend on Mexican labor, and Mexican labor needs the jobs. At the same time Mexico is losing a large proportion of her best laborers, a thing which she can hardly afford.

In 1900 there were only 100,000 Mexican immigrants in the United States, but this number has increased in almost geometrical proportion, until this year it is about 1,000,000. Mexico's total population is only about 15,000,000 and her laboring population a still smaller per cent. of this number.

Dr. Gamio has been in Jalisco, Michoacan and Guanajuato, the states from which the greatest exodus occurs, and has made a social study of the underlying causes there. He has also spent much time in the United States where he has studied the condition of the absentee workers in California, Texas, New Mexico, Illinois, Indiana, Michigan and New York, the most popular goals for the emigrants.

Perhaps Mexico is movie-mad, and whether this angle of the problem has been studied by scientists was not stated. A short conversation with the average Mexican reveals that he wants to go to the United States, and that Hollywood would be his goal. American movies have penetrated into the farthermost sierras of Mexico, and possibly the wide clean streets of Los Angeles showing on the silver screen are too much competition for the little Mexican villages of mud huts and cactus.

Science News-Letter, November 5, 1927

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African Yellow Fever

(*Continued from page* 297)

ago. According to reports received by the French Academy of Medicine this treatment was used with considerable success in an outbreak in Senegal during the past summer.

On account of the lack of transportation and other difficulties in the way of carrying out a scientific program of disease control in a primitive tropical country, the work of the International Health Board has been confined to the British colonies of Nigeria and the Gold Coast. Scientists hope these researches will lead to new light on this highly fatal disease that will eventually bring about its eradication from the face of the globe.

On his return trip, Dr. Noguchi expects to visit Egypt to study trachoma, a disease of the eye, widely prevalent there. What is believed to be the causative organism of this eye infection was recently isolated by Dr. Noguchi from the eyes of an American Indian, a race in which trachoma is commonly found in this country.

Science News-Letter, November 5, 1927

Psychology Booming

(*Continued from page* 297)

ogy, which ran from 900 to 3,000 pages, were composed on a typewriter given him by Dr. Cattell, one of the first typewriters in Germany.

The great Wundt, although kindly and genial, had no sympathy with the young American's ideas that psychology might be put to useful applications, so Dr. Cattell transferred his work to his own rooms and there made the first psychological measurements of individual differences and began to do pioneer work in applied psychology.

"The second laboratory of psychology was American, organized by Dr. G. Stanley Hall at Johns Hopkins University in 1883," Dr. Cattell said.

The new laboratory at Wittenberg College will be directed by Prof. Martin J. Reymert, formerly of the University of Oslo.

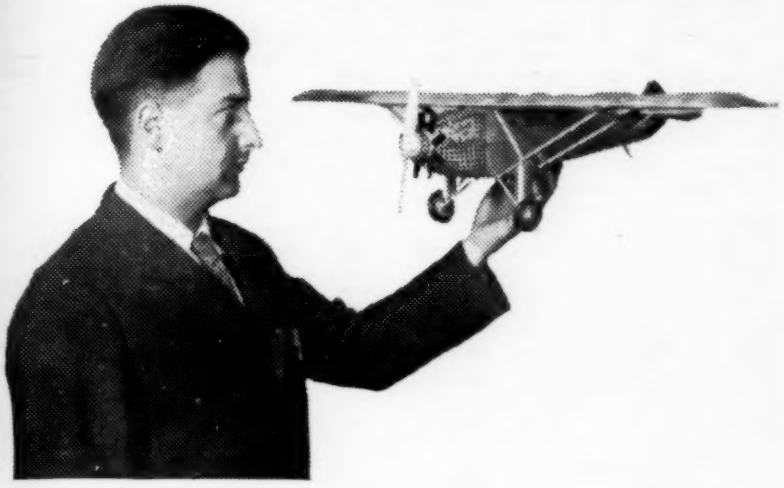
Science News-Letter, November 5, 1927

The Bureau of Standards has been studying ways of making apartment house and office walls more soundproof.

The London Zoo has received from Trinidad three giant centipedes over a foot long, with poisonous claws and fangs.

AVIATION

Building and Flying Model Airplanes



Model of Lindbergh's Plane

This is the twelfth of a series of articles by Paul Edward Garber, telling how to make model airplanes. Mr. Garber is in charge of aeronautics at the Smithsonian Institution.

The making of scale models requires a few more tools than are needed for scientific models. A small vise, a hand drill with a few small drills such as number 29, 35, 52 and 60, a hack saw with a fine blade, a small screwdriver, a light hammer and a soldering outfit will complete the additions to your shop.

Materials will resemble those which you have been using on the other two models but your frame, which is henceforth called the "fuselage," as that is the proper title, will be fastened together with small nails, such as No. 20-5/8". Fine wire will be used to make other joints. The fuselage sticks will require preliminary bending, as will the outlines of various surfaces. You will not experience any difficulty with the propeller, which must be made bigger in proportion than the one which Lindy used. We will use China silk to cover the fuselage and wing because it is more durable than paper. Metal fittings will be used to attach some parts to the fuselage; these can be readily made from tubing and will be described in their proper place. The wing will be made similarly to the one you recently constructed for the SS-2, but will embody special fittings for attachment to the fuselage and landing gear. As you proceed with this model you will find yourself adopting original methods in order to make a special fitting or construct some piece of "gingerbread" for the model.

These coming articles will teach you the general principles of making scale models. After finishing "The Spirit of St. Louis" you will undoubtedly want to increase your aerial fleet. This you can do readily enough. Plans can be secured from aeronautical magazines, books on airplane model making, or original manufacturer's blueprints. After a while you will become so adept you will be able to make a whole model with only a photograph and a few dimensions to start with. The model of Lindy's plane which the author constructed, illustrated above, was made with only three photographs and three dimensions available.

In constructing the model we will start with the fuselage. This will be made largely of sticks of pine wood, slightly larger than 1/8" square, and eighteen inches long. You should procure about eight of these. You will also need some of the small nails, some small staples, and some Ambroid. Also get a board about three feet long and some ten-penny nails, for making forms. A few small blocks of wood will be handy for making various parts.

Science News-Letter, November 5, 1927

CHEMISTRY

To A Freshman Nephew

I used to think theology
  Was rather rough on doubt,
But chemistry with ions beats
  Theology all out.

You'd better join the church before
  Your course is well begun,
Because you'll need to exercise
  The art of faith, my son.

—Uncle Rollo.

Science News-Letter, November 5, 1927

Tin is the only important metal not produced in the United States.

ARCHÆOLOGY

Bones Buried With Dog

The discovery of two deerbones painted red is a bit of evidence that Indians who lived in America 2500 years ago placed food in the graves of pet dogs so that they would have bones for their journey in the next world. The deerbones were found beside the skeletons of two prehistoric dogs by Dr. F. H. H. Roberts, Jr., of the Bureau of American Ethnology, who has just returned from an archæological expedition to Chaco Canyon, New Mexico.

The dogs appear to have been buried with ceremony by the Indians, said Dr. Roberts, in discussing his expedition. Whether the dry bones were painted red to fool the dog spirts into thinking there was good meat on the bones can only be conjectured.

The dogs belonged to Indians of the last days of the basket-maker civilization, that flourished in the southwest many centuries before the Pueblos, he said. Very ancient tribes are known as the basket makers, because they wove all their vessels and containers. In the course of centuries pottery making was learned.

Definite evidence of the Indians who lived at the time when the change from baskets to pottery was made was discovered by Dr. Roberts. Fifteen skeletons were found in two layers of earth. The burials in the lower level had no baskets or containers for food, such as have been found in similar burials. The baskets here had evidently fallen apart and disintegrated from exposure before time covered them with earth. But in the layer of earth above them were bodies accompanied by crude clay jars and bowls.

These skeletons of the transition period are of great interest to ethnologists who are studying the types of Indians who inhabited America in the days before the time of Christ.

Complete pieces of four bowls which could be patched together, even after so many centuries, were found by Dr. Roberts, as well as quantities of fragments of the rough, coarse clay containers made by the first artisans of the region who tried the potter's trade.

Science News-Letter, November 5, 1927

A London gardener is trying the plan of putting a small "dog tent" of glass, shaped like a bell, over each early vegetable plant to protect it from frost.

How to Use Key-Word Feature of News-Letter

In order to aid in catching the items that concern you and to facilitate clipping and filing, a key word in small capitals has been printed on the right of the line above each article. The key words used fit into any system of classification, whether it be a straight alphabetical file, a system of your own devising, the Library of Congress classification or the Dewey system.

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210 Natural theology
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650 Communication. Commerce
660 Chemical technology
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PLANT PHYSIOLOGY

Classics of Science: First Studies of Transpiration

Hales' sunflower in the sealed pot, and spearmint plant attached to the inverted syphon, as described in the experiments quoted below.

VEGETABLE STATICKS, by Stephen Hales, London, M,DCC,-XXVII.

Moisture Perspired By Plants

July 3, 1724. In order to find out the quantity imbibed and perspired by the Sun-Flower, I took a garden-pot (Fig. 1), with a large *Sun-Flower, a*, 3 feet + ½ high, which was purposely planted in it when young.

I covered the pot with a plate of thin milled lead, and cemented all the joints fast, so as no vapor could pass, but only air, thro' a small glass tube *d* nine inches long, which was fixed purposely near the stem of the plant, to make a free communication with the outward air, and that under the leaden plate.

I cemented also another short glass tube *g* into the plate, two inches long and one inch in diameter. Thro' this tube I watered the plant, and then stopped it up with a cork; I stopped up also the holes *i, l* at the bottom of the pot with corks.

I weighed this pot and plant morning and evening, for fifteen several days from *July* 3 to *August* 8, after which I cut off the plant close to the leaden plate, and then covered the stump well with cement; and upon weighing found there perspired through the unglazed porous pot two ounces every twelve hours day, which being allowed in the daily weighing of the plant and pot, I found the greatest perspiration of twelve hours in a very warm dry day, to be one pound fourteen ounces; the middle rate of perspiration one pound four ounces. The perspiration of a dry warm night, without any sensible dew, was about three ounces; but when any sensible, tho' small dew, then the perspiration was nothing; and when a large dew, or some little rain in the night, the plant and pot increased in weight two or three ounces. N. B. *The weights I made use of were* Avoirdupois *weights.*

Surface of Leaves

I cut off all the leaves of this plant, and laid them in five several parcels, according to their several sizes, and then measured the surface of a leaf of each parcel, by laying over it a large lattice made with threads in which the little squares were ¼ of an inch each; by numbering of which I had the surface of the leaves in square inches, which multiplied by the number of the leaves in the corresponding parcels, gave me the area of all the leaves; by which means I found the surface of the whole plant, above ground, to be equal to 5616 square inches, or 39 square feet.

I dug up another Sun-flower, nearly of the same size, which had eight main roots, reaching fifteen inches deep and sideways from the stem: It had besides a very thick bush of lateral roots, from the eight main roots, which extended every way in a Hemisphere, about nine inches from the stem and main roots.

In order to get an estimate of the length of all the roots, I took one of the main roots, with its laterals, and measured and weighed them, and then weighed the other seven roots, with their laterals, by which means I found the sum of the length of all the roots to be no less than 1448 feet.

And supposing the periphery of these roots at a medium, to be 10/76 of an inch, then their surface will be 2286 square inches, or 15.8 square feet; that is, equal to ⅜ of the surface of the plant above ground.

If, as above, twenty ounces of

(*Just turn the page*)

ARCHÆOLOGY

Aztec Calendar Found

The calendar stone of Montezuma and other interesting relics of the ancient Mexican civilization have been uncovered during repairs made on the National Palace in Mexico City, which houses the executive offices of President Calles. The objects are now in the National Museum adjoining the palace.

The calendar stone, the largest of the carvings found, is said by Prof. Ramon Mena, head of the department of archaeology of the museum, to be the votive offering of Montezuma II to the sun in return for having started auspiciously the cycle of 52 years beginning in 1507, hardly a dozen years before the coming of the Spanish conquerors and the fall of the Aztec empire. The preceding cycle beginning in 1455 is represented as having been initiated with famines and other calamities.

On the sides of the huge stone block are the carved seated figures of priests. One, extending offerings, represents the emperor Montezuma. On the top surface of the stone are

(*Just turn the page*)

CHEMISTRY

Vitamins For Margarine

A butter substitute that will contain as many calories and more vitamins than the old fashioned product of the cow can be made available at a low price, scientists in London declare.

In view of the general shortage of dairy products, chief source of the vitamins necessary for health and growth, Drs. O. Rosenheim and T. A. Webster of the National Institute for Medical Research, have suggested to the scientific journal, *Nature*, a cheap and effective butter substitute. Fats from livers of such readily available animals as sheep, calves and oxen, they report, contain ten times the amount of vitamin A as exists in cod liver oil.

"The well-known skill of the margarine manufacturer," Dr. Rosenheim explains, "should enable him so to incorporate the liver fats with his product as to convert a dietary article, already identical with butter in calorific value, into a cheap and palatable product of equal biological efficiency, so far as vitamin A is concerned."

The no less important rickets preventing vitamin D, another variable constituent of butter, can be supplied by mixing in small quantities

(*Just turn the page*)

Aztec Calendar

(*Continued from page* 301)

symbols of sacrifice and figures of fire serpents. On the back surface of the stone are carved symbols representing the foundation of Tenochtitlan, the ancient Mexico City, and its development under the protection of the god of rain and harvest. The front surface represents the sun on the right and Montezuma on the left.

When the Spanish conquerors entered ancient Tenochtitlan, Montezuma was made a prisoner in his own palace. After his death and after the final defeat of the Aztecs under another leader early in the sixteenth century, the great temple was destroyed and the city razed to the ground. On the site of Montezuma's palace, Cortez built his own, and the present National Palace was enlarged from that. Much of the building material used came from the ruins of Aztec temples, and the relics which have been recently placed in the National Museum were dug from the ancient foundations laid down by Cortez.

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Vitamins in Margarine

(*Continued from page* 301)

of irradiated ergosterol. This is a recently discovered product of great potency believed to be the parent substance of the anti-rachitic vitamin. After exposure for regulated periods of time to ultra-violet light, it is capable of curing human rickets in as small doses as from two to four milligrams daily.

"The margarine manufacturers," continues Dr. Rosenheim, "have therefore at their disposal, if they care to make use of them, means which should make a perfect biological substitute for butter accessible, without unduly raising the price of margarine. Moreover, by carefully controlled methods of manufacture, it should be possible to supply a product of constant vitamin content, superior in this respect to natural butter, the vitamin content of which depends on too many uncontrollable factors in the food supply of the cow."

Science News-Letter, November 5, 1927

Flax is grown in this country almost entirely for its seed.

Prehistoric people of Central America and Mexico used oil centuries before American oil wells were "discovered" and developed.

Studies of Transpiration

(*Continued from page* 301)

water, at a medium, perspired in twelve hours day (*i. e.*) thirty-four cubick inches of water (a cubick inch of water weighing 254 grains) then the thirty-four cubick inches divided by the surface of all the roots, is = 2286 square inches; (*i e.*) 34/2286 is = 1/67, this gives the depth of water imbibed by the whole surface of the roots *viz.* 1/67 part of an inch.

And the surface of the plant above ground, being 5618 square inches, by which dividing the 34 cubick inches, *viz.* 34/5616 = 1/165, this gives the depth perspired by the whole surface of the plant above ground, *viz.* 1/165 part of an inch.

Hence, the velocity with which water enters the surface of the roots to supply the expense of perspiration, is to the velocity, with which the sap perspires, as 165 : 67, or as 1/67 : 1/165, or nearly as 5 : 2.

The area of the transverse cut of the middle of the stem is a square inch; therefore the areas, on the surface of the leaves, the roots, and stem, are 5616, 2286, 1.

The velocities, in the surface of the leaves, roots, and transverse cut of the stem, are gained by a reciprocal proportion of the surfaces.

$$\text{Area of} \begin{cases} \text{leaves} = 5616 \\ \text{roots} = 2286 \\ \text{stem} = 1 \end{cases} \left| \text{Velocity} \right| \begin{cases} = \frac{1}{5616} \\ = \frac{1}{2286} \\ = 1 \end{cases} \text{ or as } \begin{cases} \frac{1}{165} \text{ inch} \\ \frac{1}{67} \text{ inch} \\ 34 \text{ inch} \end{cases}$$

Now, their perspiring 34 cubick inches in twelve hours day, there must so much pass thro' the stem in that time; and the velocity would be at the rate of 34 inches in twelve hours, if the stem were quite hollow.

In order therefore to find out the quantity of solid matter in the stem, *July 27th at 7 a. m.* I cut up even with the ground a Sun-flower; it weighed 3 pounds; in thirty days it was very dry, and had wasted in all 2 pounds 4 ounces; that is ¾ of its whole weight: So here is a fourth part left for solid parts in the stem, (by throwing a piece of green Sunflower stem into water, I found it very near the same specifick gravity with water) which filling up so much of the stem, the velocity of the sap must be increased proportionably, *viz.* 1/3 part more, (by reason of the reciprocal proportion) that 34 cubick inches may pass the stem in twelve hours; whence its velocity in the stem will be 45 1/3 inches in twelve hours, supposing there be no circulation nor return to the sap downwards.

Inverted Syphon

Spear-mint being a plant that thrives most kindly in water, (in order the more accurately to observe what water it would imbibe, and perspire by night and day, in wet or dry weather) I cemented at *r* a plant of it *m*, into the inverted syphon *r y x b* (Fig. 2), the syphon was ¼ inch diameter at *b*, but larger at *r*.

I filled it full of water, the plant imbibed the water so as to make it fall in the day, (in *March*) near an inch and one-half from *b* to *t*, and in the night ¼ in. from *t* to *i*: but one night, when it was so cold, as to make the Thermometer sink to the freezing point, then the mint imbibed nothing, but hung down its head; as did also the young beans in the garden, their sap being greatly condensed by cold. In a rainy day the mint imbibed very little.

I pursued this Experiment no farther, Dr. *Woodward* having long since, from several curious experiments and observations, given an account in the Philosophical Transactions of the plentiful perspiration of this plant.

These two experiments, only slightly modified, are still a part of the required work in all beginning courses in plant physiology, and the same methods are still being used also for much work in more advanced research.

Stephen Hales was born in Kent, September 7 (or 17), 1677, and died at Teddington January 4, 1761. His scientific work included experiments on the pressure of sap in plants and of blood in animals, rate of growth of plants, and their nourishment from the air, which began the science of plant physiology. He also made some attempts to study "air" derived from heating vegetable substances, from metals, and from shells. In these experiments he actually worked with oxygen, carbon dioxide, hydrogen, and perhaps other gases, but without distinguishing them from the air which he knew. But these experiments warned him of the dangers of "vitiated air" and led him to devise ventilating systems which materially helped conditions in prisons and on shipboard. Hales' most important book, *Vegetable Staticks*, from which the above experiments are reprinted, was published in 1727, when the author was 50 years old. The printing was ordered for the Royal Society by Isaac Newton, the president, only a month before Newton's death. Hales had been elected a Fellow of the Society ten years before.

Science News-Letter, November 5, 1927

X-rays can be used to detect hidden cracks in wooden parts of airplanes.

Massachusetts automobile license tags for 1928 are to carry a small picture of a codfish, as a kind of state trade-mark.

First Glances at New Books

LIVING MACHINERY—A. V. Hill—*Harcourt, Brace* ($3). The 1926 Christmas Lectures for Children at the Royal Institution with two chapters added when Dr. Hill gave the whole set as the Lowell lectures at Boston in 1927. The mechanism of the human body set forth objectively in a way that makes one understand the popularity of the famous Christmas lectures with children as well as their elders.

Science News-Letter, November 5, 1927

THE METHODS OF ORGANIC CHEMISTRY—C. W. Porter, T. D. Stewart, G. U. K. Branch—*Ginn and Company* ($2). A laboratory manual prepared by three members of the faculty of the University of California.

Science News-Letter, November 5, 1927

THE SONG OF SONGS—Translated by Theophile James Meek—*University of Chicago Press.* A little book of limited edition that contains in modern translation the famous songs of Solomon. It is part of the project of making the Old Testament readable.

Science News-Letter, November 5, 1927

THE BRITISH COAL DILEMMA—Isador Lubin and Helen Everett—*Macmillan* ($2.50). Here is a study of a great industry made by economists as if they were entomologists looking down upon an ant hill. It is encouraging that an Institute of Economics is now considering political, sociological and industrial problems as though they can be solved by scientific methods—which they can. In this study of British coal there is considered by analogy America's own problem and the plight of all British industry.

Science News-Letter, November 5, 1927

EXTENSION SERVICE HANDBOOK ON AGRICULTURE AND HOME ECONOMICS—Compiled by T. Weed Harvey — *Government Printing Office* ($1.50). A blocky little pocket-size volume containing an amazing mass of information on all imaginable agricultural topics, leather-bound for hard use and exhaustively indexed for quick reference.

Science News-Letter, November 5, 1927

CHEMISTRY AND RECENT PROGRESS IN MEDICINE—Julius Stieglitz—*Williams and Wilkins.* A report of important advances made in medicine with the aid of chemistry.

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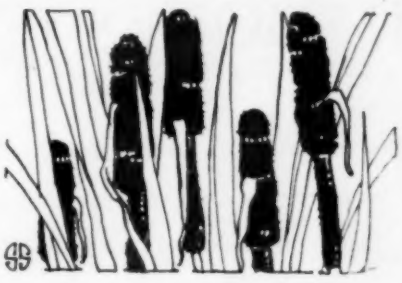
BIOLOGY

NATURE RAMBLINGS

By FRANK THONE



Cat-tails

The pretty bright eyes of the little field mouse
Looked far o'er the meadow one day,
And he said to his sister, "Don't stay in the house—
Let's travel!" His sister said, "Yea."

They passed by white daisies and cardinals red,
Till they came to the region of bogs;
"Oh, see that high grass with brown tops," sister said;
"Those are cat-tails," quoth one of the frogs.

"Ho-ho!" and "Ha-ha!" laughed the two little mice,
"Cats delight in our innocent blood;
"If those really are cat-tails, how awfully nice:
"All *those* cats must be stuck in the mud!"

Cat-tails have appealed to the imagination of children for ages. The name has a most decided appearance of having been thought of by a child. Their brush-shaped seed-heads are used for all sorts of implements in the serious occupations of childhood: they are brushes and brooms in play-houses; they are cattle in mimic herds; they are sausages in pretended butcher-shops, they are gun-rammers in imaginary warfare. Soaked in surreptitiously obtained kerosene they become torches and fireworks at night.

Fortunately for children, cat-tails are found in practically every land where children exist. What games little Kalmucks or Athabasca Indians may play with them we do not know, but that they play some games is practically certain. At least they do not lack the opportunity. Even the youngsters of the desert-dwelling Bedouins know them, for oases almost always have marshy spots where cat-tails may flourish.

Some day, when the pressure becomes great enough, the children may find cat-tail contributing to their breakfast porridge as well as to their amusements. For cat-tails store quantities of starch in their thick rootstocks down underneath the mud, and this starch is perfectly good for food. At present the trouble of extracting it would not be justified by the returns. But if the time comes when we have to exploit our bogs the cat-tail is ready for us with a full bread-basket.

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MEDICINE

Antitoxin For Erysipelas

Erysipelas is on the high road to becoming a vanquished disease. An antitoxin for this painful inflammation of the skin has been tried out with great success by Drs. Douglas Symmers and Kenneth M. Lewis at the Bellevue Hospital, where one of the largest erysipelas services in the world is maintained.

The antitoxin was developed by Dr. K. E. Birkhaug of Rochester, N. Y., and first announced to the medical world about a year and a half ago. His results were so encouraging that Dr. Symmers decided to try out the treatment on patients at the Bellevue. The erysipelas cases were divided into two groups, one half of which received the antitoxin while the other half were treated by the usual methods followed in the past. Progress in the first group was so notable, however, that the physician in charge of the controls, a man of many years' experience in the treatment of the disease, requested after a period of critical observation that all the cases receive the antitoxin.

In a report of his results to the American Medical Association, Dr. Symmers stated that mortality for erysipelas at the Bellevue in the past has been around 10 per cent. while that for the present series was about five per cent., a reduction of nearly one-half.

"The antitoxin treatment of erysipelas," he declared, "marks an advance, the results of which are commensurate with those obtained in the treatment of diphtheria."

The treatment has obvious economic advantages both to hospitals and patients, Dr. Symmers pointed out, since it reduces the period of cent. It effects great saving as well of bed linen and sleeping garments by doing away with the destructive results of ointments and local applications. The antitoxin is given by intramuscular injection. Erysipelas of the face yields to treatment more readily than that of the body, it is stated.

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The wading bird is about 14 inches tall, 11 inches of it being leg.

THE WORLD MOVES SWIFTLY

and we must all keep step with the progress the days bring forth. New inventions leap to page one head-lines—new discoveries lengthen life and give us intimate knowledge of other ages, other types of inhabitants . . . lengthy names confuse—SCIENCE SERVICE gives to the world and his wife FACTS that are the essence of accuracy yet are phrased so that the layman can understand perfectly each new development.

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